THE MODERN CRUSADE AGAINST TUBERCULOSIS

By Prof. IRVING FISHER

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THE MODERN CRUSADE AGAINST CONSUMPTION

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Personally, I am interested in tuberculosis, as one who has had it and been cured of it. But I am persuaded that the interest in it should not be confined to those who have had it, nor to the medical profession. There should be a general interest in the subject, for several reasons. In the first place, tuberculosis is a general disease. No other disease except pneumonia has any death rate like it. The mortality from tuberculosis equals that from peritonitis, appendicitis, scarlet fever, typhoid fever, diphtheria, grippe, cancer and smallpox combined. In this country one person in nine dies of it; and of the deaths which occur between the ages of fifteen and forty-five, one-third are due to tuberculosis. In Germany, between the ages of twenty and twenty-five, almost half of the deaths are from tuberculosis.

Not only is the prevalence of the disease shown by the number who die of it, but there is evidence that "latent" tuberculosis occurs in still greater frequency among those who never die of it, and who usually never even know that they have it. Nageli concludes an extended investigation with the statement that practically *every adult has latent tuberculosis.* This means that each of us has encysted in his lungs a certain number of bacilli which might cause the disease, but which usually give no trouble because kept under control by good health or by the firmness of the growth in which they are incased.

Not only is consumption a common disease, but it is an infectious disease, and this is another reason why the public should be interested in it. It used to be thought that consumption was the type of a hereditary disease, and only specified classes of persons could have it. As a matter of fact, any kind of physique may be attacked. Persons with small chests and who inherit small "resisting power" are more apt to succumb to the disease than others, but no one is immune. For instance, a case is reported even in Colorado of a strong man who caught it by occupying a tent with a consumptive who expectorated his infection upon the floor. The disease, however, is communicable in practically only one way—through the expectoration, and this is dangerous only when dry and pulverized. Moist sputum is harmless (unless coughed into the face or inoculated into an open wound, or communicated through a kiss on the mouth), but when a mass of sputum containing millions of bacilli is deposited in the corridors of the postoffice or railway station and, becoming dry, is trodden upon, the dust thus formed distributes these millions of bacilli through the atmosphere and they are inhaled by all who breathe it. Out-of-doors the infection soon becomes too diluted to be harmful except to the weakest system, for a healthy body is a germ-killing apparatus. The disease spreads through infected buildings. Dr. Biggs, in New York, has shown that in particular tenement houses there have been sometimes over a dozen successive cases.

A third reason why every one ought to know something about consumption is that it is so easily preventable. In fact, it is only because of the general ignorance and indifference about it that this fiendish disease is allowed to have its way among us. It is prevented in two ways: First, by destruction of the bacilli; and, secondly, by fortifying the system to resist them. Consumptives should have paper spit-cups, which,

with the expectorations, should be burned daily; apartments which have been occupied by consumptives should be reported to the local board of health and properly disinfected. Spitting upon the floor should be prevented. But ordinances against spitting, to be effective and enforced, must first be sustained by an educated public sentiment.

Our most important and immediate resource, however, is in defensive rather than offensive warfare. If we keep "in condition," we can safely resist the attacks, not only of tubercle bacilli, but of other germs as well.

Not only is consumption a preventable disease; it is now known to be a curable disease. But it can be cured only provided it is taken in time, and provided the proper hygiene is adopted. If it is not taken in time, it soon reaches the incurable stage. Consumption is not a self-limiting disease, but a parasitic disease. It begins at some small point, like a fire in a house, and, like the fire can be smothered and put out if it does not get too much headway. But when once beyond a certain point, it cannot be extinguished. Consequently, an early diagnosis is one of the important medical questions of the day, and fortunately the medical profession is gradually waking up to the fact that it has not been diagnosing this disease early enough. It has depended too much on "physical signs," and too little on microscopic examination of the sputum. Free examination of sputum is now provided by most city boards of health, and ought to be availed of by every one who has a persistent cough with yellow sputum.

It should be observed that tuberculosis always has been curable. But until recently the early and curable stage of the disease was not recognized as really consumption, but "only a threatening." In the light of modern knowledge it is practically certain that Napoleon, Goethe, Von Moltke, Cecil

Rhodes, Emerson, Tolstoi, Richard Strauss, and a host of other prominent personages were cases of cure. I have a long list of living men and women who were cured years ago, though few of their acquaintance know of it. The agency by which cure was effected was once thought to be solely "good climate." But Brehmer, in Germany, conceived the idea, which today is almost universally accepted, that climate is of secondary importance, and that it is the out-of-door life and other hygienic conditions, rather than climate, which perform the cure. He therefore started a sanatorium, in 1859, having first cured himself of the disease in this way. He put his patients through this treatment and kept them out of doors in the daytime as long as the weather was pleasant. One of his patients, Dr. Dettweiler, afterward started a sanatorium of his own. Our modern sanatorium treatment all comes from him. Dettweiler went further than Brehmer, in that he paid no attention to the weather. Patients now even sleep out of doors all the year round.

In this country the first physician to take up the Dettweiler method was Dr. E. L. Trudeau. He has gradually developed the Adirondack Cottage Sanitarium, an institution on Dettweiler principles. After Dr. Koch, in 1882, discovered the bacilli nature of the disease, Dr. Trudeau also established a laboratory, which has been the pioneer of American institutions for the scientific study of the disease. He has been ably assisted by Dr. E. R. Baldwin. Dr. Gardiner of Colorado Springs was one of the first to have patients sleep out of doors. His results were astonishingly good, and this method is now widely employed. The patient sleeps out even in winter. With few exceptions, the colder the weather, the better the patient likes it, and the greater the benefit he derives. I have myself slept out when the thermometer registered ten degrees below zero, Fahrenheit. Last winter, at the Adirondack Cottage Sanitarium, six patients, including one lady,

slept out (with marked benefit) even when the mercury reached thirty below. A woolen headgear with opening for the nose, warm night clothes, woolen sheets, not many blankets over one, but two or more warm mattresses (cotton, wool or feathers) underneath, are all that is necessary to make one comfortable and luxurious.

Sleeping out of doors has hitherto been more common in California and Colorado than in the East, but Dr. Millet of Brockton, Mass., has proved in his sanatorium that it is possible in New England, and his example has been widely followed. It may now be pretty confidently asserted that it is feasible and beneficial in all climates and seasons. The patient, instead of catching cold, as the uninitiated always fear, becomes almost absolutely immune to colds. The only ill effects thus far observed seem to be occasional neuralgia and catarrh (both of which are avoidable if the bed is sufficiently protected from wind), and frostbites of the nose or ears, which likewise may be avoided by proper protection. One determined lady in Colorado, with a thin, aquiline nose, used to protect that member by a nose mask, which gave her the appearance of a football player. Such treatment could, of course, be followed at home, and sometimes is, but until the old prejudices against night air, dampness, and infinitesimal "drafts" are abolished (and in order to help abolish them) we need numerous sanatoria. The first State to establish a State sanatorium was Massachusetts. At Rutland there is a large State institution, and a very successful one. Rhode Island is contemplating one; New York has a half-million-dollar institution under way; New Jersey is reported to have appropriated $300,000 for the same purpose; Delaware, Maryland, Illinois and Michigan, and a great many individual cities, as New York, Philadelphia, Boston New Haven, Scranton, Chicago, St. Paul and Montreal, are

making an active crusade against the disease. A great deal of money has already been given by philanthropists to this object. In Philadelphia Mr. Phipps alone has given $1,000,000 for the purpose of eradicating the disease in that city; for the object of this movement is not simply to cure a few consumptives, but ultimately to wipe off the disease from the face of the earth.

The treatment does not consist of fresh air alone, but of four principal "cures," viz.: air cure, food cure, rest cure, and mind cure. The air cure is the most important. One can go without air but a few minutes without dying, whereas one may go without food for a month before death occurs. Moreover, we inhale from the atmosphere daily, or ought to, one and three-fourths pounds of oxygen, which is more than the absorption of food that goes on even in a working man. But in order to absorb enough oxygen to maintain vigorous health, it is necessary to breathe pure air twenty-four hours a day. The ordinary city man breathes impure air more than twenty-three hours out of the twenty-four. This is the great predisposing cause of tuberculosis, and, in fact, for that matter, of every disease. The consumptive sanatorium provides pure air, partly by ventilation, but mainly by the much simpler and more effective method of keeping its patients out of doors eight or ten hours in the daytime, and, if possible, ten hours at night. The devices to secure this result are numerous and interesting. A covered porch protected from the wind on one side, or at most two sides, is the first requisite for day use. A reclining chair, and for winter a fur coat and blankets, with "pontiacs" and moccasins of the legs and feet, complete the outfit. Snugly ensconced in such a cozy corner, the invalid finds himself independent of wind, rain, fog, or snow, and spends his days in resting, talking and playing games with his companions, or in reading or writing. The monotony is broken by occasional drives or walks,

and by meals, to which he usually comes with a keen appetite. At night he returns perhaps to the same porch for a good sound sleep in Nature's delightful, pure, life-giving "night air." A curtain, which in a storm can be rolled up from the bottom by means of a cord running to the head of the bed, may be placed at the exposed side, but under ordinary circumstances should not be used. In the rainless months of Colorado the invalid may spread his sleeping bag, camp bag, or cowboy tarpaulin under the stars and go to sleep to the barking of coyotes and awake with the morning twilight and the birds, always with a peculiar sense, like a sublimated sense of taste, of that wonderful air, "strong as wine and pure as water." Thus does he get close to Nature. Or, he may sleep in a tent, though too often he shuts his tent up like a room. It is a cardinal error to think that a tent ventilates itself "through the meshes of the canvas." The fact is that canvas is far more impervious to air than almost any other cloth. This is why it makes good sails. An ordinary "A" tent or wall tent with ridge-pole, to be of real use, must be open at both ends and have an open space all around, between the floor and the tent walls. Even then this tent is inferior to the Gardiner tent, with outlets for air in the top and inlets around the edge of its circular floor; for the breath rises, being considerably warmer than the surrounding air, and only needs the slightest encouragement to be carried out at the top and thus prevented from returning to the nose. The tent of Dr. Gardiner was suggested by the Indian tepee. In this way does civilized man confess the necessity of regaining health by recourse to the primitive life of barbarians! The same up-draft principle is employed in the Holmes tent, the Munson army tent, and a tent which I have recently constructed. Not a bad way of sleeping out is to project the head of the bed or cot out of the window. Still an-

other good way is to place the bed directly under a window, wide open at the top, which, however, only secures absolutely pure air if another window on a different side of the room is also open, so that the sleeper lies directly *under* (but not necessarily *in*) a draft.

Next to the air cure comes the food cure. Air supplies only oxygen; food supplies more than a dozen other chemical elements. A consumptive needs abundance of food, and he needs to eat it with his stomach rested. Consequently, the food cure consists, first of all, in going to one's meals rested. Patients in sanataria are often required to lie down an hour before each meal. They are taught to eat slowly, to eat a moderate and well-selected variety, to eat especially nitrogenous foods, such as meat and eggs, and to take a great deal of milk. The quantity that can be consumed when the stomach is rested and the disease calls for the food to fight it is astonishing!

There is now, however, a strong reaction against forced feeding. The experiences of Dr. Holden at the Agnes Memorial Sanatorium Denver and of Dr. Lyman at the Gaylord Farm Sanatorium, near New Haven, as well as of several English authorities, indicates that three good meals with appetite are better than five forced ones without it. The experience of Dr. Russell of New York and others also shows that meat may often, if not always, be dispensed with, probably with advantage. But the last word has not yet been spoken on the best diet for consumptives. We need to know whether a specific diet can be found, as for scurvy, or whether, as Dettweiler believes, the problem is purely one of suiting individual needs.

Next, as to the rest cure. It used to be supposed that a consumptive needed exercise, and in the old days many a consumptive killed himself by horseback riding, rowing, or some other vio-

lent form of exercise. It is true that exercise is beneficial, but it should always be within the fatigue limit, and for the consumptive that limit is never far off. In numerous cases a relapse has been caused by a sudden over-exertion. This is one of the chief reasons why, outside of sanatoria, consumptives so rarely get well. They lack the self-control to keep within their strength.

Finally, as to the mind cure. Consumptives can be quite as nervous as other people, popular opinion to the contrary notwithstanding. Mental depression is one of the worst foes they have to fight and overcome. Those I have known who have gotten well fastest have been precisely those who have thought least about themselves and who have been the most cheerful. The most remarkable case of cure I ever saw was a man in the Adirondacks who, after being there a short time, said that he had learned how to dispense with worry altogether. He used to go about and comfort others, and on a gloomy, wet day, he would say: "This is the kind of day when you need to be twice as cheerful." That man was very ill, but he got well with prodigious rapidity. Many a consumptive has really recovered without knowing it, but kept in a state of nervous depression for months or even years, imagining always that it was his lungs that were at fault, when, as a matter of fact, it was simply his nerves, or, rather, his mind. A peaceful, trustful, care-free mind promotes digestion, guarantees sleep, and quickens all the functions of the body. Cheerful amusements, companionship, and reading are important aids. But the main thing is for the patient himself to acquire the knack of "dropping" his troubles.

These four features, then—the air, food, rest, and mind cures—combined with due use of sunlight, bathing, clothing, etc., constitute the modern sanatorium treatment, destined, I believe, to

have far-reaching and profound influence not only in diminishing and ultimately eradicating tuberculosis, but in likewise ridding us of other diseases, lengthening human life, and making it healthier and more worth living. Already the death rate from tuberculosis is rapidly decreasing. In England it declined in seventy years from thirty-nine per ten thousand of population to thirteen. Although sanatoria did not exist in the early part of this period, England did have (and was the first country to introduce) consumptive hospitals, which served like isolation wards to prevent the spread of infection. These hospitals, together with the English love of out-of-door sports and the use of ventilating appliances and open fireplaces, are probably the explanation of their growing freedom from consumption. In France the conditions and results are both opposite. In Germany, during the past fifteen years, the death rate has declined from thirty-one to nineteen and one-half—a full third less. In the United States the death rate in 1900, in the area for which registration has been well kept, was nineteen, as against twenty-six in 1890, showing a decline of twenty-five per cent in ten years. In New York City, owing larely to the work of Waring and Biggs, the death rate has diminished in twenty years nearly forty per cent. It is no losing fight which is being made against the disease. Every blow tells, and it is a conservative prediction that the next three decades will each see more remarkable improvement. Many more sanatario are needed. Any one institution can do but little, although a single sanatorium of Germany records two hundred and eight living graduates of three years' standing or more.

It must never be forgotten that a chief, I would like to say *the* chief, effect of this increasing number of sanatoria distributed throughout the world will be, not on their patients, but on their neighborhood. They will gradually ef-

fect a revolution in the habits of living of the community. This is my hope and belief. Nor is it a dream only. The effects are already plainly visible. As Dr. Knopf has pointed out in Germany the death from consumption have enormously decreased in localities where consumptive sanatoria have long been established for the reason that the sanatorium has been an object-lesson and its graduates unconscious missionaries. Such a sanatorium is not a menace to public health as many foolistly fear but on the other hand is an efficient means of improving sanitary and hygienic conditions and habits.

The methods of such an institution are not "specific" for tuberculosis; they are simply the methods of living which produce and maintain general health and which all who wish to improve their vitality should adopt. In short, well-conducted consumptive sanatoria are today the greatest practical schools of hygiene in the world. Already their methods have been adopted in the treatment of nervous exhaustion and other chronic ailments. A wide observation also shows that people who keep well live long, and have abundant working power, are almost invariably persons who have followed, unconsciously it may be, some or all of the four cardinal principles of hygiene. Whole families that I know in California and Colorado do likewise and maintain an enviable level of good health. A few in New England follow the same methods and obtain the same results. I have examined the facts about many centenarians. Most of them follow out-of-door vocations, or, if not, have out-of-door avocations. Thus, a banker centenarian was passionately devoted to gardening. Nor have they followed air-hygiene alone. Almost invariably they have avoided worry; that is, they have practiced mind-hygiene. One attributes his longevity to thorough mastication—food hygiene; another to sound sleep—rest hygiene.

Just as long-lived people witness to the truth

of the four cardinal rules of hygiene by their conformity to them, so short-lived people prove their truth by breaking them. Who are the invalids who fill the health resorts of Colorado and California? Invariably the victims of indoor life, of food bolting of overwork and of worry. I have often wondered what would happen to the human race if it should suddenly adopt sleeping out of doors ventilating dwellings, factories, and schools, taking proper time for meals, learning the art of relaxation and the habit of equanimity. It is certain that life would be longer, and also fuller. Professor Shaler of Harvard says that the normal duration of life for mammals is five times the growing period. Horned cattle take about four years to mature, and they live about twenty. Horses take five or six years, and live nearly thirty. Elephants mature in forty, and live two hundred years. Man, according to Professor Shaler's criteria, takes about thirty years to come to his full maturity, and by this calculation ought to live to be a hundred and fifty. This may never happen, and may be physiologically impossible, but we have wandered so far from nature that there is certainly room for much improvement between the forty-one years, which is the average lifetime of an American, and the hundred and fifty years just mentioned.

Before any great progress can be made, however, our change of habits must be radical, however gradually adopted. We must open our bedroom windows wider and at the tops, rather than at the bottoms. We must substitute electric lights for oil and gas, one jet of which is the equivalent of three or four persons in its power to vitiate the air. We must learn anew what pure air is and insist on having it, not only at home, but in our offices, our clubs, theaters, churches and sleeping cars, and, above all, in our factories and our schools. We must lengthen our lunch hours and our hours of sleep and

recreation. We shall find that our work will go better and faster, and more will be accomplished in the end. We must take up seriously, and religiously even, the cultivation of healthy mental attitudes and the consequent elimination of fear, anger, depression, and other morbid states. We must be "born again." Such thorough change of heart must of necessity come slowly. An important force to bring it about is the desire of parents to bring up their children with the advantages of modern hygiene. But the parents themselves must first learn what that hygiene is. To show them is one of the tasks of the new sanatoria.

We see, then, that the modern crusade against consumption means more than appears on the surface. It means, to be sure, the saving of the lives of many afflicted with the "great white plague," but it means, further, a continual lessening in the numbers thus afflicted. It means the destruction of billions of our miscropic foes, and the strengthening of our physiological defenses against them. It means more attention by our medical schools and family physicians to hygiene and preventive medicine, and less to drugs. It means that tuberculosis will soon be dethroned from its position as chief of the diseases, and ultimately eradicated altogether. It means that other diseases will follow; that, as Pasteur has said, "it is in the power of man to rid himself of every parasitic disease." It means that human life will be longer, and, what is better, healthier, happier, and more useful. It means that together with physical health will come increased mental, moral, and spiritual health. It means, in short, that a long step will have been taken toward the regeneration of the world.